

CHAPTER 15

WEAPON RECOVERY OPERATION

15-1 GENERAL

A mixture of weapons, weapon components, contaminants, and other hazardous debris may be at a nuclear weapon accident site. The number and type of weapons, the extent of damage, and the location of weapons, weapon components, and hazards are of primary concern. If the weapons appear to be intact, and radioactive contaminants have not been dispersed, the complexity of the problem is lessened considerably. However, even intact weapon(s) may pose significant recovery problems with potential explosive and contamination hazards. A continuing assessment of the situation is needed to determine the best method for conducting weapon recovery.

15-2 PURPOSE AND SCOPE

This chapter provides information about weapon operations following a nuclear weapon accident. Also, requirements and planning are discussed to develop operational plans for recovery of nuclear weapons, weapon components, and other hazardous materials.

15-3 SPECIFIC REQUIREMENTS

Service responsibilities for weapon recovery operations include all actions through transfer of weapon custody to a designated Department of Energy (DoE) representative. During weapon recovery operations, personnel:

- a. Determine the status and location of the weapon(s), including whether high explosive detonations occurred.
- b. Assess weapon(s) damage.
- c. Perform render safe procedures on the weapon(s).
- d. Initiate a systematic search until the location for the weapon(s) and all weapon components is known.
- e. Establish an area and develop procedures for processing/ packaging contaminated weapon(s) and components.

- f. Perform necessary actions for transport or shipping of the weapon(s) and components for interim storage and/ or final disposition.

15-4 RESOURCES

The On-Scene Commander (**OSC**) can request many types of support during the **accident** response operation. The principal resources available to meet weapon recovery responsibilities are Explosive Ordnance Disposal (**EOD**) Teams and the DoE Accident Response Group (**ARG**).

- a. Explosive Ordnance Disposal. EOD personnel are responsible for the actual performance, supervision, and control of hands-on weapon recovery operations. The following guidelines apply to the employment of EOD teams:

- (1) The Service or Unified Commander having primary responsibility for command and control on-site at the accident provides, or obtains from the appropriate Service, EOD teams that are Service certified on the weapon(s).

- (2) All Service or Unified Command EOD teams provide emergency support until the designated EOD team arrives.

- (3) Navy EOD teams recover weapons located under water because only Navy EOD personnel are trained in diving techniques.

- (4) EOD personnel, officer and enlisted, are graduates of the Navy School, Explosive Ordnance Disposal at Indian Head, MD. They are trained in access techniques and are the only personnel qualified to perform render safe procedures. Also, they are trained to identify, detect, contain and/or eliminate explosive, radiological and toxic hazards associated with nuclear weapons. Intensive training is conducted on render safe procedures for weapons unique to their individual Service.

- (5) The EOD team provided, or obtained, by the Service having primary command and control **responsibility** will safe the weapon(s). If an extremely hazardous situation exists, the initial responding EOD team with

the publications and capabilities to safe the weapon should do so. The continuation of any render safe procedures are conducted by an EOD team qualified on the particular weapon(s) involved.

(6) The organization of EOD teams varies among Services as does the number and seniority of personnel assigned; however, all teams have the same basic capabilities and are trained in radiological control and monitoring techniques applicable to their operations. They have the necessary communications and personal safety equipment to operate in an accident environment. Moreover, teams have a background in weapon design information enhanced by coordination with DoE scientific advisors on arrival at the accident scene. Navy EOD teams maintain a complete inventory of all U.S. nuclear weapon “publications, and Army EOD units maintain publications for render safe procedures (**RSP**) for all Services nuclear weapon systems. While tasks assigned to EOD personnel are clearly in the realm of weapon **safing** and disposal, they must operate within the framework of the overall response group and conduct operations only as directed by the OSC.

(7) The EOD teams actions, by priority are:

(a) Prevention of nuclear detonation.

(b) Prevention of a nuclear contribution or a high explosive detonation.

(c) Identification, detection, containment and, if required, **the** elimination of explosive and radiological hazards resulting from the accident or incident.

(d) Protection of personnel against hazards noted in (a) through (c) above.

b. Department of Energy. The DoE ARG includes weapon design personnel and explosive experts familiar with weapons and associated hazards. The ARG provides technical advice and assistance in the collection, identification, decontamination, packaging, and disposition of weapon components, weapon debris, and resulting radioactive materials; and technical advice and assistance to EOD teams in render safe and recovery procedures. Each nuclear weapon has render safe procedures developed, evaluated, coordinated, and authenticated as binding jointly by the DoD and DoE. Since weapons may have been subjected to extreme stress during an accident, consideration may be given to the DoE unique equipment to assess the applicability of these procedures.

(1) DoE radiographic capabilities are available for field diagnostics of damaged weapons in the event of an incident/ accident. The Los Alamos National Laboratory (**LANL**) has **fieldable** radiographic units

with accompanying film, film processing, and viewing equipment. LLNL has an equivalent radiographic capability which serves as a back-up to the LANL unit.

(2) DoE aerial radiological surveys by the Aerial Measurement System (**AMS**) assist in locating weapons and weapon components. This capability is addressed in Appendix 5-C.

(3) Additional information concerning the ARG, DoE radiographic capabilities, the AMS, and other DoE capabilities may be obtained from the **JNACC**.

15-5 CONCEPT OF OPERATIONS

Weapon recovery begins with the initial reconnaissance, proceeds through the conduct of render safe procedures, and ends with hazard removal and disposal of the weapons and components. These operations are discussed in this concept of operations. The two-person policy must be strictly enforced when working with nuclear weapons. In the early stages of accident response, personnel may find it difficult to follow all of the required security measures however, the OSC should implement necessary security procedures as soon as possible.

a. Initial Entry. During the initial entry, weapons and the aircraft, vehicle, or missile wreckage present several hazards. Nuclear weapons and some components contain conventional explosives and other hazardous materials. Nuclear material may have been dispersed on impact, during detonation of explosives, or by combustion in a fire. Weapons may need stabilizing to prevent further damage or explosions. Other explosive items which may be encountered include conventional munitions, aircraft fire extinguisher cartridges, engine starter cartridges, pyrotechnics, and egress or extraction devices. Leaking fluids, liquid oxygen, propellants, oxidizers, shredded or torn metals, and composite materials/fibers present additional hazards. The initial reconnaissance team should mark hazards clearly.

b. Render Safe Procedures. The OSC is responsible ultimately for the proper implementation of any render safe procedures. The EOD team evaluates and analyzes the accident situation and advises the OSC of the safest and most reliable means for neutralizing weapon associated hazards. Render safe procedures may begin, if required, as soon as the reconnaissance has been completed. Handling of nuclear weapons in an accident must be done according to written procedures. If the weapon is in a **stable** environment, no immediate actions **should** occur until a coordinated weapon recovery procedure has been developed by EOD personnel and

DoE ARG representatives. These procedures must be approved by the OSC after coordination with the DoE Team Leader and the senior member of the EOD Team. Consideration must be given to the following when determining a course of action:

(1) Explosive ordnance and accident debris are inherently dangerous, but some minimum number of personnel may have to be exposed to hazards to complete the mission.

(2) Consequences should be evaluated before exposing personnel to hazards.

(3) When available, DoE radiographic equipment is used to assess internal damage and aid standard EOD procedures. ARG capabilities and knowledge, combined with EOD team procedures and experience in render safe procedures under hazardous conditions, provide the best method of determining a weapon's condition before it is moved.

(4) Staging, decontamination, packaging, and the method, type, and final disposition of shipment should be an integral part of the RSP planning phase.

(5) The high priority given to weapon recovery operations does not inherently imply a need for rapid action. Personnel and public safety must never be sacrificed solely for speed.

c. Nuclear Weapon Security. The two-man rule must be enforced strictly when working with nuclear weapons. The OSC should ensure that all personnel are familiar with the rule and that it is strictly enforced. Physical security safeguards required to prevent unauthorized access to classified information and proper control and disposition of classified material must be strictly enforced during all operations involving the weapon(s) or weapon components. Because of the technical information requirements during nuclear weapon operations, some documents at the accident scene may contain critical nuclear weapon design information (CNWDI). The sensitive information contained in these documents requires that security measures be implemented consistent with the highest classification assigned. Personnel working in an area containing CNWDI should be properly cleared and authorized until recovery discussions are complete and the items have been covered or removed.

d. Search Techniques. The location of all weapons and components **must be determined**. Depending upon the accident circumstances, weapons and weapon components may be scattered and/or buried over a large area. A systematic search may be required over a large, area until accountability for all the weapons and weapon

components is re-established. The search may become a time consuming operation requiring numerous personnel. The search method used by the OSC depends on many factors including the number of personnel available, topography, and environmental conditions. Metal detectors and **RADIAC** equipment maybe needed to locate all weapons and components. As components are found, their location should be marked, the position recorded on a map, and photographed. The items should be removed to a storage area after coordination with accident investigators, safety and security permitting. If all components are not found, the EOD team leader should coordinate with the ARG and make recommendations to the OSC concerning additional search procedures which can be tried, and at what point the search for components will cease. Search techniques that may be employed are:

(1) Coarse Search. A search in loose crisscrossing patterns designed to locate weapon components rapidly. This technique is used by EOD and radiological monitoring personnel to search the accident area soon after the accident has occurred.

(2) Aerial Radiological and Photographic Survey. This technique is used to identify areas of **significant** radioactive intensity to assist in locating missing weapon components and to provide high resolution photography.

(3) Instrument Search. Metal and radiation detectors monitor those areas where weapons or components were found previously. This method may supplement the visual search.

(4) Visual Search. A search normally conducted by a slow-moving line of personnel positioned abreast at various intervals dependent upon the object to be located.

(5) Scarifying Procedure. Components may have been buried during the accident or subsequently covered by wind action. A road grader equipped with scarifiers (large steel teeth) is used to plow a surface. Search teams should follow the graders and conduct a visual and/or instrument search for missing components. This system has proven successful in past search operations. Coordination must be made with the Joint Hazard Evaluation Center (JHEC) prior to implementing techniques to **assess** personnel protection requirements due to resuspension and the potential impact on site decontamination and restoration.

e. Hazard Removal. Another major step in weapon recovery begins with the removal of identified hazards. The OSC establishes priorities for removing all hazards so that other response personnel may conduct opera-

tions. It is unsafe for anyone but task trained personnel under EOD supervision to clear an area of broken, scattered, or resolidified high explosives.

f. Disposal. After the weapons are evaluated by EOD and DoE as safe for movement and in coordination with accident investigators, weapons are moved to a designated weapon storage area.

(1) On-site disposal of high explosives depends on available space and hazards presented, including resuspension of contaminants. Storage area or disposal sites should be large enough to minimize hazards to personnel in the event of a detonation. The distances that storage areas are separated from other operations is determined by the type and amount of explosives stored. An isolated and segregated area should be set aside for the exclusive storage of **exposed** or damaged explosives.

(2) If open storage is used, protection from the elements and information sensors, including satellite surveillance, must be provided for weapons and weapon components.

g. Storage of Explosives. If explosive items cannot be stored separately, a balance of safety and practical considerations requires assignment of each item to a storage group based on compatibility characteristics.

h. Custody. Each Service has publications that address the storage, security, and safety aspects associated with nuclear weapons, these publications also address requirements for the custody of nuclear weapons and weapon components. Moreover, performance of EOD procedures does not, in itself, constitute transfer of custody to the EOD team. Final disposition of damaged weapon(s) and/ or components involves return of these devices to the DoE. Therefore, close coordination between the **OSC** and the DoE team leader is necessary throughout the weapon recovery phase. Custody of damaged weapon(s) and components is transferred to the DoE at a point determined jointly by the **OSC** and the DoE team leader.

i. Packaging and Marking. Transportation specialist consultation is required for weapon(s), weapon components, and/ or explosives damaged or subjected to extreme forces during accidents. Before weapon(s),

weapon components, and/ or explosives are shipped, they must be packaged to ensure that no contamination breaches the container and that the environment experienced during shipment will not cause further damage or explosions. To ensure this requirement, special packing, shipping, marking and safety instructions must be obtained to comply with transportation regulations from the DoD, DoE, and DoT.

j. Shipment. When the disposition decision has been made, DoD or DoE may be assigned the primary responsibility for moving the weapons. Nuclear weapons will be moved by the safest means and over the safest routes. Movement should be kept to a minimum. Shipments of weapons/weapon components will be routed to a DoE facility for examination, analysis, and final disposition.

15-6 ACCIDENT RESPONSE PLAN ANNEX

The weapon operations annex/ recovery plan should establish the procedures used during weapon operations. This annex should include:

a. Definition of the relationship between EOD personnel and DoE weapon experts and their respective responsibilities.

b. Procedures for locating and identifying weapon components and debris.

c. Procedures for establishing a secure staging/ storage area.

d. Procedures for moving weapons and components to the secure staging/storage area.

e. Procedures for packaging weapon components.

f. Procedures for shipping weapons and components.

g. Guidelines for establishing electromagnetic radiation hazard areas.

h. Procedures for re-establishing accountability for weapons and weapon components.